WHAT IS CLAIMED IS:

1. A communication relay device connected to a home network, for relaying information between an outside
5 communication device connected to an outside network and a home communication device connected to the home network, comprising:

a first copyright protection unit configured to carry out a first authentication and key exchange
10 processing for purpose of copyright protection between the communication relay device and the home communication device on the home network;

a second copyright protection unit configured to carry out a second authentication and key exchange
15 processing for purpose of copyright protection between the communication relay device and the outside communication device on the outside network, based on a scheme different from the first authentication and key exchange processing;

20   an identification information memory unit which stores an identification information of the outside communication device; and

a bridge processing unit configured to receive an access request for the home network from the outside
25 communication device, and carry out transmission/reception of information between the home

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network and the outside network only when the outside
communication device which made the access request is
stored in the identification information memory unit
and then only when both the first authentication and

5   key exchange processing by the first copyright
protection unit and the second authentication and key
exchange processing by the second copyright protection
unit succeed.

10   2.   The communication relay device of claim 1, further
comprising a registration control unit configured to
limit a number of outside communications devices that
can be stored in the identification information memory
unit to a prescribed number,

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    3.   The communication relay device of claim 1, further
comprising a registration control unit configured to
prohibit a deletion of a stored identification
information in the identification information memory

20   unit.

    4.   The communication relay device of claim 1, wherein
the identification information memory unit stores in
advance at least one of a device ID for identifying the

25   outside communication device and a physical address of
a communication interface for purpose of copyright

protection, before transmitting contents to the outside
communication device.

5.   The communication relay device of claim 1, wherein
5 the identification information memory unit has a mode
for storing a result of the second authentication and
key exchange processing by the second copyright
protection unit, in a state where an access to the home
network is permitted to the outside communication
10 device.

6.   The communication relay device of claim 5, further
comprising:
    a user information memory unit which stores a user
15 authentication information for the outside
communication device; and
    an authentication judgement unit configured to
judge whether the user authentication information of
the outside communication device which made the access
20 request for the home network is stored in the user
information memory unit or not;
    wherein the bridge processing unit judges whether
or not to permit an access between the home network and
the outside network, according to a judgement result of
25 the authentication judgement unit.

7.   The communication relay device of claim 5, further comprising:

a user information memory unit which stores a user authentication information for the outside
5 communication device; and

an authentication judgement unit configured to judge whether the user authentication information of the outside communication device which made the access request for the home network is stored in the user
10 information memory unit or not;

wherein the identification information memory unit stores at least one of a device ID for identifying the outside communication device and a physical address of a communication interface for purpose of copyright
15 protection, according to a judgement result of the authentication judgement unit.

8.   The communication relay device of claim 1, wherein the identification information memory unit has a mode
20 for storing a result of the first authentication and key exchange processing by the first copyright protection unit.

9.   The communication relay device of claim 8, further
25 comprising:

a user information memory unit which stores a user

authentication information for the outside
communication device; and

an authentication judgement unit configured to
judge whether the user authentication information of
5   the outside communication device which made the access
request for the home network is stored in the user
information memory unit or not;

wherein the bridge processing unit judges whether
or not to permit an access between the home network and
10   the outside network, according to a judgement result of
the authentication judgement unit.

10.   The communication relay device of claim 8, further
comprising:
15   a user information memory unit which stores a user
authentication information for the outside
communication device; and

an authentication judgement unit configured to
judge whether the user authentication information of
20   the outside communication device which made the access
request for the home network is stored in the user
information memory unit or not;

wherein the identification information memory unit
stores at least one of a device ID for identifying the
25   outside communication device and a physical address of
a communication interface for purpose of copyright

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protection, according to a judgement result of the
authentication judgement unit.

11. The communication relay device of claim 1, further
5 comprising:
a Web page production unit configured to produce a
Web page describing information for controlling or
monitoring the home communication device; and
a Web page disclosing unit configured to transmit
10 the Web page produced by the Web page production unit
to the outside network;
wherein the outside communication device controls
or monitors the home communication device by using the
Web page received through the outside network.
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12. The communication relay device of claim 1, wherein
the first copyright protection unit realizes copyright
protection by adopting at least one of a provision for
limiting a TTL (Time To Live) field of a packet
20 transmitted/received between the home communication
device and the outside communication device to a
specific value, a provision for using a link local
address in an Internet protocol, and a provision for
using a Ethernet frame as a transmission packet.
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13. The communication relay device of claim 1, further

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comprising a routing control unit configured to notify a specific port number to a connection device for carrying out a connection control for the home network and the outside network, and make a setting such that a

5   packet transmitted to the specific port number will be transmitted to the communication relay device.

14. The communication relay device of claim 1, further comprising a routing control unit configured to notify

10   a global IP address of the communication relay device to a connection device for carrying out a connection control for the home network and the outside network, and make a setting such that a packet destined to the global IP address will be transmitted to the

15   communication relay device.

15. The communication relay device of claim 1, wherein the bridge processing unit also carries out at least one of a coding conversion, a protocol conversion and a

20   bandwidth conversion for data entered from one of the outside network and the home network, and then transmits converted data to another one of the outside network and the home network.

25   16. A communication system, comprising:
     a home communication device on a home network;

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an outside communication device on an outside
network; and

a communication relay device for relaying
information between the home network and the outside
5   network, the communication relay device having:

a first copyright protection unit configured to
carry out a first authentication and key exchange
processing for purpose of copyright protection between
the communication relay device and the home
10   communication device on the home network;

a second copyright protection unit configured
to carry out a second authentication and key exchange
processing for purpose of copyright protection between
the communication relay device and the outside
15   communication device on the outside network, based on a
scheme different from the first authentication and key
exchange processing;

an identification information memory unit which
stores an identification information of the outside
20   communication device; and

a bridge processing unit configured to receive
an access request for the home network from the outside
communication device, and carry out
transmission/reception of information between the home
25   network and the outside network only when the outside
communication device which made the access request is

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stored in the identification information memory unit
and then only when both the first authentication and
key exchange processing by the first copyright
protection unit and the second authentication and key
5   exchange processing by the second copyright protection
unit succeed.

17.   A computer program product for causing a computer
to function as a communication relay device connected
10   to a home network, for relaying information between an
outside communication device connected to an outside
network and a home communication device connected to
the home network, the computer program product
comprising:
15   a first computer program code for causing the
computer to carry out a first authentication and key
exchange processing for purpose of copyright protection
between the communication relay device and the home
communication device on the home network;
20·   a second computer program code for causing the
computer to carry out a second authentication and key
exchange processing for purpose of copyright protection
between the communication relay device and the outside
communication device on the outside network, based on a
25   scheme different from the first authentication and key
exchange processing;

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a third computer program code for causing the computer to store an identification information of the outside communication device; and

a fourth computer program code for causing the
5   computer to receive an access request for the home network from the outside communication device, and carry out transmission/reception of information between the home network and the outside network only when the outside communication device which made the access
10   request is stored in the identification information memory unit and then only when both the first authentication and key exchange processing by the first computer program code and the second authentication and key exchange processing by the second computer program
15   code succeed.

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